401 KAR 42:071

PRE APRIL 18, 1994
UNDERGROUND STORAGE TANK (UST) SYSTEM
VOLUNTARY CLOSURE OUTLINE

NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DIVISION OF WASTE MANAGEMENT
UNDERGROUND STORAGE TANK BRANCH
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October 1995

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INTRODUCTION

In accordance with Kentucky Administrative Regulation 401 KAR 42:071, this document establishes voluntary closure standards for owners and operators of underground storage tank (UST) systems that permanently closed, or that had a confirmed release without permanent closure, prior to April 18, 1994. This outline provides the minimum requirements for documentation and assessment of the site in accordance with 401 KAR 42:071. This outline in no way eliminates the owner or operator's option of performing permanent closure or receiving a closure letter by following the outlines in place at the time of permanent closure.

Facilities with additional UST systems permanently closed after April 18, 1994 or that had a confirmed release after April 18, 1994, shall comply with all requirements of 401 KAR 42:070 and 42:080.

For facilities that had a confirmed release or that performed permanent closure of UST system(s) prior to August 1, 1991, refer to sections 1.0 and 2.0. For facilities that had a confirmed release or that performed permanent closure of UST system(s) between August 1, 1991, and April 18, 1994, refer to sections 1.0 and 3.0.

For definition of terms used within this outline, refer to 401 KAR 42:005.

Closure of UST facilities in accordance with this outline shall not constitute designation as a residual landfill.

SECTION 1.0 SITE REQUIREMENTS

The following criteria shall be met for all UST facilities requesting no further action in accordance with 401 KAR 42:071.

1.1 All facilities shall have performed permanent closure of UST system(s) or had a confirmed release without permanent closure of UST system(s) prior to April 18, 1994.

1.2 The UST facility shall be registered with the UST Branch. If the UST facility is not registered, the owner or operator shall register the UST facility by submitting a Notification for Underground Storage Tank(s) Form (DEP5024) in accordance with 401 KAR 42:020 and 42:200.

1.3 The owner or operator shall submit a letter to the Cabinet indicating their desire to have the facility reviewed in accordance with the requirements specified in 401 KAR 42:071. The letter shall contain the UST facility identification number for the site, the specific UST system(s) to which this request applies, and the name, address, and phone number for the owner or operator. The letter shall be signed by the owner or operator. This letter shall also include basic information about the site (for example, site name, site address, site county, etc.).

SECTION 2.0 CLOSURE REQUIREMENTS FOR UST FACILITIES WHICH PERMANENTLY CLOSED UST'S OR HAD A CONFIRMED RELEASE WITHOUT UST PERMANENT CLOSURE PRIOR TO AUGUST 1, 1991

The following minimum documentation and assessment is required in order to determine if no further action shall be necessary for UST systems that permanently closed or had a confirmed release prior to August 1, 1991.

2.1 All soil and water sampling shall be performed using SW-846 test methods as indicated in Table A and Table B.

2.2 The tank pit walls shall be sampled in the following manner:

Tank Removal:

- All tank pit walls shall be sampled and analyzed. Analysis of at least one (1) composite laboratory sample that represents all of the tank pit walls shall be submitted to the UST Branch.

Tank Closure in Place:

- One (1) representative soil sample shall be collected and analyzed from the area that corresponds to each wall of the tank pit. Collection of the soil sample shall be achieved by borings, trenches, or other appropriate methods. There shall be a minimum of one (1) sample collected and analyzed from each area of the tank pit wall location. Analysis of all samples collected shall be submitted to the UST Branch.

2.3 The tank pit bottom shall be sampled in the following manner:

Tank Removal:

- At least one (1) representative laboratory sample from the bottom of the tank pit area shall be collected and analyzed. Analysis of all samples collected shall be submitted to the UST Branch.

Tank Closure in Place:

- Due to the inability to assess below the tank(s), the tank pit bottom is not required to be sampled. The sampling requirements from the area that corresponds to each wall of the tank pit for closure in place will be sufficient for the pit area sampling.

2.4 If a background sample is necessary, a minimum of one (1) representative sample shall be collected from an area upgradient and unaffected by a potential release. The sample shall be collected at a minimum depth of three (3) feet below the ground surface. Analysis of all background samples collected shall be submitted to the UST Branch.

2.5 Additional sampling and analysis may be required, as directed by the Cabinet, for facilities that initiated site investigation activities in lieu of sampling the excavation zone at the time of permanent closure.

2.6 A Removal Assessment Report (DEP4058/08/89) or a Closure Assessment Report Form (DEP4058/11/90) shall be completed and submitted. If one of the above mentioned forms has not been submitted, two (2) copies of a Closure Assessment Report Form (DEP 4058) shall be completed, including all available information, and submitted to the UST Branch. The forms may be completed and signed by the owner, operator, contractor, or consultant.

2.7 If the minimum sampling requirements are not available or have not been achieved, re-sampling of the former tank pit area will be allowed by following the above listed requirements in Section 2.0.

2.8 If the minimum sampling requirements, listed above, cannot be followed, a letter shall be submitted to the UST Branch explaining why the sampling requirements cannot be followed. The letter shall also include an alternative sampling plan proposal that will properly assess the UST system.

2.9 If the analyzed levels are greater than those listed in Table A or Table B, the owner or operator shall have the following options:

(a) Continue to excavate soil contamination or perform a site investigation and corrective action until the allowable cleanup levels specified are met. The outlines that were in place at the time of permanent closure or the confirmed release shall continue to be followed; or

(b) Classify the UST facility in accordance with 401 KAR 42:080 in order to determine site specific cleanup levels and either continue to excavate soil contamination or perform a site investigation and corrective action in accordance with 401 KAR 42:060 until the allowable levels specified in 401 KAR 42:080 are met.

TABLE A

Analytical Requirements for Soil Samples
For Sites Permanently Closed or a Confirmed Release Without Permanent Closure
Prior to August 1, 1991

Product Stored in Tank	Analysis Required	Acceptable Method	Allowable Cleanup Levels
Gasoline, Kerosene, or Jet Fuel	BTX	SW-846	B: < 1.00 ppm T: < 1.00 ppm X: < 7.000 ppm
Diesel or Regulated Heating Oil	Chrysene c PAH n PAH NAP	SW-846	Chrysene < 15.0 ppm c PAH: < 1.0 ppm n PAH: < 3.0 ppm NAP: < 1.0 ppm
Waste Oil	Oil and Grease Total Lead	SW-846 SW-846	< 10.0 ppm or less than Established Background < 50.0 ppm or less than Established Background
Re-Sample for Waste Oil or New Oil	Chrysene c PAH n PAH NAP Total Lead	SW-846 SW-846	Chrysene < 15.0 ppm c PAH: < 1.0 ppm n PAH: < 3.0 ppm NAP: < 1.0 ppm < 50.0 ppm or less than Established Background
Other Petroleum or Non-Petroleum	Contact the UST Branch		

BTX: Benzene, Toluene, and Xylene

c PAH: Allowable Cleanup Level Individually for Benzo(a)Anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, and Indeno(1,2,3-cd)pyrene

n PAH: Allowable Cleanup Level Individually for Acenaphthene, Acenaphthylene, Anthracene, Benzo(ghi)perylene, Fluoranthene, Fluorene, Phenanthrene, and Pyrene

NAP: Naphthalene

ppm: part per million (mg/kg)

TABLE B

Analytical Requirements for Water Samples For Sites Permanently Closed or a Confirmed Release Without Permanent Closure Prior to August 1, 1991

Product Stored in Tank	Analysis Required	Acceptable Method	Allowable Cleanup Levels
Gasoline, Kerosene, or Jet Fuel	BTX	SW-846	B: < 0.005 ppm T: < 1.000 ppm X: < 10.00 ppm
Diesel or Regulated Heating Oil	c PAH n PAH NAP	SW-846	c PAH: < 0.005 ppm n PAH: < 3.0 ppm NAP: < 0.3 ppm
Waste Oil	Oil and Grease	SW-846	< 5.0 ppm or less than Established Background
	Total Lead	SW-846	< 0.05 ppm or less than Established Background
Re-Sample for Waste Oil or New Oil	c PAH n PAH NAP	SW-846	c PAH: < 0.005 ppm n PAH: < 3.0 ppm NAP: < 0.3 ppm
	Total Lead	SW-846	< 0.05 ppm or less than Established Background
Other Petroleum or Non-Petroleum	Contact the UST Branch		

BTX: Benzene, Toluene, and Xylene

c PAH: Allowable Cleanup Level Individually for Benzo(a)Anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Chrysene, Dibenzo(a,h)anthracene, and Indeno(1,2,3-cd)pyrene

n PAH: Allowable Cleanup Level Individually for Acenaphthene, Acenaphthylene, Anthracene, Benzo(ghi)perylene, Fluoranthene, Fluorene, Phenanthrene, and Pyrene

NAP: Naphthalene

ppm: part per million (mg/kg)

SECTION 3.0 CLOSURE REQUIREMENTS FOR UST FACILITIES WHICH PERMANENTLY CLOSED OR HAD A CONFIRMED RELEASE WITHOUT PERMANENT CLOSURE OF A UST SYSTEM BETWEEN AUGUST 1, 1991 AND APRIL 18, 1994

The following minimum documentation and assessment procedures shall be required in order to determine if no further action shall be necessary for UST systems which permanently closed or had a confirmed release between August 1, 1991 and April 18, 1994.

3.1 All soil and water sampling and analysis shall be performed using the appropriate SW-846 test methods specified in Table C and Table D.

3.2 Each tank pit wall shall be sampled in the following manner:

Tank Removal:

- Grid each tank pit wall into four (4) equal sections.
- Collect one (1) representative composite soil sample consisting of a grab sample from each of the grid sections.
- At least one (1) representative composite soil sample shall be collected and analyzed from each wall in the tank pit area.

Tank Closure in Place:

- Representative soil samples from soil borings shall be collected and analyzed from the area that corresponds to each wall of the tank pit. Samples shall be collected as close as possible to the UST.
- There shall be at least one (1) representative sample collected from the area that corresponds to each wall of the tank pit, with a minimum of four (4) samples collected and analyzed from the areas that correspond to the tank pit walls. Each sample shall be a composite sample that is representative of the total depth of the borings.
- Borings shall be advanced to a minimum depth of two (2) to three (3) feet below the bottom of the tank(s).

3.3 The tank pit bottom shall be sampled in the following manner:

Tank Removal:

- Grid the tank pit bottom into four (4) equal sections.
- Collect one (1) representative composite soil sample consisting of a grab sample from each of the grid sections.
- At least one (1) representative composite soil sample shall be collected and analyzed from the bottom in the tank pit area.

Tank Closure in Place:

- Due to the inability to assess below the tank(s), the tank pit bottom is not required to be sampled. The sampling requirements from the area that corresponds to each wall of the tank pit for closure in place will be sufficient for the pit area sampling.

3.4 The piping trench shall be sampled in the following manner:

Piping Removal:

- The piping trench shall be divided into four (4) equal sections.
- One (1) representative composite soil sample consisting of a grab sample from each of the sections shall be collected.
- At least one (1) representative composite soil sample shall be collected and analyzed from the piping trench area. If the piping trench is over one-hundred (100) feet long, then additional piping trench sampling shall be performed. For each one-hundred (100) foot section of piping trench, at least one (1) representative composite sample shall be collected.

Piping Closure in Place:

- The piping trench shall be divided into four (4) equal sections.
- One (1) representative composite soil sample consisting of a grab sample from each of the sections shall be collected. Samples shall be collected as close as possible to the piping. Collection of soil samples shall be achieved by borings, trenches, or other appropriate methods. For each one-hundred (100) foot section of piping trench, at least one (1) composite sample shall be collected.

3.5 The excavated material shall be sampled in the following manner:

- Grid each excavated material pile into four (4) equal sections.
- Collect one (1) representative composite soil sample consisting of a grab sample from each of the grid sections.

3.6 If a background sample is necessary, a minimum of five (5) representative samples shall be collected and composited from an area upgradient and unaffected by a potential release. The sample shall be collected at a minimum depth of three (3) feet below the ground surface. A minimum of one (1) composite sample shall be analyzed.

3.7 If water is encountered during permanent closure activities, a representative sample of the water shall be collected and analyzed in accordance with Table D.

3.8 A groundwater sample shall be collected from the hydrogeologically downgradient area most likely to be affected by a release from the UST system if the water indicates levels above those listed for groundwater in Table D.

3.9 A groundwater sample shall be collected from the hydrogeologically downgradient area most likely to be affected by a release from the UST system if water was encountered during permanent closure activities but not sampled and analyzed.

3.10 A groundwater sample shall be collected from the hydrogeologically downgradient area most likely to be affected by a release from the UST system if a clean tank pit bottom soil sample is not possible due to the presence of bedrock. If a tank(s) is being closed in place, a groundwater sample shall be collected from the hydrogeologically downgradient area most likely to be affected by a release from the UST system if bedrock is encountered in soil borings prior to achieving the required depth of two (2) to three (3) feet below the bottom of the tank.

3.11 Additional sampling and analysis may be required, as directed by the Cabinet, for facilities that initiated site investigation activities in lieu of sampling the excavation at the time of permanent closure.

3.12 A site sketch, indicating the tank locations, piping trench locations, property boundaries, all sampling locations, and any other pertinent site features shall be submitted to the UST Branch.

3.13 Laboratory analysis reports for all samples collected and analyzed shall be submitted to the UST Branch.

3.14 Chain-of-Custody sheet(s) or a laboratory log shall be submitted to the UST Branch for all samples collected and analyzed.

3.15 A Closure Assessment Report Form (DEP4058) shall be completed and submitted. If this form has not been submitted to the UST Branch, one shall be completed with all available information and an original and one (1) copy shall be submitted to the UST Branch. The form shall be signed by the owner, operator, contractor, or consultant.

3.16 If the minimum sampling requirements are not available or have not been achieved, re-sampling of the tank pit and piping trench areas will be allowed by complying with the above listed requirements in Section 3.0.

3.17 If the above listed minimum sampling requirements cannot be followed, a letter shall be submitted to the UST Branch explaining why the sampling requirements cannot be followed. The letter shall also include an alternative sampling plan proposal that will properly assess the UST system.

3.18 If the analyzed levels are greater than those listed in Table C or Table D, the owner or operator shall have the following options:

(a) Continue to excavate soil contamination or perform a site investigation and corrective action until the allowable cleanup levels specified are met. The outlines that were in place at the time of permanent closure or the confirmed release shall continue to be followed; or

(b) Classify the UST facility in accordance with 401 KAR 42:080 in order to determine site specific cleanup levels and either continue to excavate soil contamination or perform a site investigation and corrective action in accordance with 401 KAR 42:060 until the allowable levels specified in 401 KAR 42:080 are met.

TABLE C

Analytical Requirements for Soil Samples
For Sites Permanently Closed or a Confirmed Release Without Permanent Closure
Between August 1, 1991, and April 18, 1994

Product stored in tank	Analysis	Acceptable Method	Allowable Cleanup Levels
Gasoline, Kerosene, or Jet Fuel	BTEX	Method 5030 in conjunction with SW-846 8240, 8260, 8020, or 8021	B: < 1.00 ppm T: < 1.00 ppm E: < 1.00 ppm X: < 7.00 ppm
Diesel or regulated Heating Oil	Chrysene c PAH n PAH NAP	Method 3540 or 3550 in conjunction with SW-846 8100, 8270, or 8310	Chrysene < 15.0 ppm c PAH < 1.0 ppm n PAH < 3.0 ppm NAP < 1.0 ppm
Waste Oil	Oil & Grease Total Lead	Method 3540 or 3550 in conjunction with SW-846 9071 SW-846 7420, 7421, or 6010	< 10.0 ppm or less than Established Background < 50.0 ppm or less than Established Background
New Oil	Oil & Grease	Method 3540 or 3550 in conjunction with SW-846 9071	< 10.0 ppm or less than Established Background
Re-Sample for Waste Oil or New Oil	Chrysene c PAH n PAH NAP Total Lead	Method 3540 or 3550 in conjunction with SW-846 8100, 8270, or 8310 SW-846 7420, 7421, or 6010	Chrysene < 15.0 ppm c PAH: < 1.0 ppm n PAH < 3.0 ppm NAP < 1.0 ppm < 50.0 ppm or less than Established Background
Other Petroleum or Non-Petroleum	Contact the UST Branch		

BTEX: Benzene, Toluene, Ethylbenzene, and Xylene
c PAH: Allowable Cleanup Level Individually for Benzo(a)Anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, and Indeno(1,2,3-cd)pyrene
n PAH: Allowable Cleanup Level Individually for Acenaphthene, Acenaphthylene, Anthracene, Benzo(ghi)perylene, Fluoranthene, Fluorene, Phenanthrene, and Pyrene
NAP: Naphthalene
ppm: part per million (mg/kg)

TABLE D

Analytical Requirements for Water Samples
For Sites Permanently Closed or a Confirmed Release Without Permanent Closure
Between August 1, 1991, and April 18, 1994

Product stored in tank	Analysis	Acceptable Method	Allowable Cleanup Levels
Gasoline, Kerosene, or Jet Fuel	BTEX	Method 5030 in conjunction with SW-846 8240, 8260, 8020, or 8021	B: < 0.005 ppm T: < 1.0 ppm E: < 0.7 ppm X: < 10.0 ppm
Diesel or regulated Heating Oil	c PAH n PAH NAP	Method 3510 or 3520 in conjunction with SW-846 8100, 8270, or 8310	c PAH: < 0.005 ppm n PAH: < 3.0 ppm NAP: < 0.3 ppm
Waste Oil	Oil & Grease	Method 3510 or 3520 in conjunction with SW-846 9070	< 5.0 ppm or less than Established Background
	Total Lead	SW-846 7420, 7421, or 6010	< 0.05 ppm or less than Established Background
New Oil	Oil & Grease	Method 3510 or 3520 in conjunction with SW-846 9070	< 5.0 ppm or less than Established Background
Re-Sample for Waste Oil or New Oil	c PAH n PAH NAP	Method 3510 or 3520 in conjunction with SW-846 8100, 8270, or 8310	c PAH: < 0.005 ppm n PAH: < 3.0 ppm NAP: < 0.3 ppm
	Total Lead	SW-846 7420, 7421, or 6010	< 0.05 ppm or less than Established Background
Other Petroleum or Non-Petroleum	Contact the UST Branch		

BTEX: Benzene, Toluene, Ethylbenzene, and Xylene

c PAH: Allowable Cleanup Level Individually for Benzo(a)Anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Chrysene, Dibenzo(a,h)anthracene, and Indeno(1,2,3-cd)pyrene

n PAH: Allowable Cleanup Level Individually for Acenaphthene, Acenaphthylene, Anthracene, Benzo(ghi)perylene, Fluoranthene, Fluorene, Phenanthrene, and Pyrene

NAP: Naphthalene

ppm: part per million (mg/kg)

PRE APRIL 18, 1994 VOLUNTARY REGULATION KAR 42:071 FINAL CHECKLIST

Site Name _____ **County** _____

Location _____ **UST ID #** _____

Instructions

Place the page # next to each item included in the voluntary closure report. Address all items in writing within each specific section in the report. The completed checklist shall be submitted with each copy of the final report in order to expedite review of the voluntary closure report.

Page #		**2.0 Requirements Prior to August 1, 1991**
_____	2.1	All soil and water sampling was performed by using SW-846 test methods
_____	2.2	All tank pit walls were sampled according to Section 2.0 requirements
_____	2.3	The bottom of the tank pit was sampled according to Section 2.0 requirements
_____	2.4	Ambient background was sampled according to Section 2.0 requirements if applicable
_____	2.5	Additional sampling was conducted, if necessary
_____	2.6	A Removal Assessment Report Form or a Closure Assessment Report Form is included
_____	2.7	All minimum sampling requirements according to Section 2.0 were followed during re-sampling, if necessary
_____	2.8	The UST Branch has been contacted in writing explaining why the sampling requirements cannot be followed, including the alternative sampling plan, if necessary
_____	2.9	The facility was classified in accordance with 401 KAR 42:080, if necessary
		3.0 Requirements Between August 1, 1991 and April 18, 1994
_____	3.1	All soil and water sampling was performed by using the required SW-846 test methods
_____	3.2	Each tank pit wall was sampled according to Section 3.0 requirements
_____	3.3	The bottom of the tank pit was sampled according to Section 3.0 requirements
_____	3.4	The piping trench was sampled according to Section 3.0 requirements
_____	3.5	The excavated material was sampled according to Section 3.0 requirements
_____	3.6	Ambient background was sampled according to Section 3.0 requirements
_____	3.7	A water sample was collected according to Section 3.0 requirements, if necessary
____	3.8	Hydrogeologically downgradient groundwater was sampled because of elevated levels, if necessary
_____	3.9	Hydrogeologically downgradient groundwater was sampled because of contaminated pit water or pit water not sampled according to Section 3.0 requirements, if necessary
_____	3.10	Hydrogeologically downgradient groundwater was sampled because of encountered bedrock according to Section 3.0 requirements, if necessary
_____	3.11	Additional sampling was conducted, if necessary
_____	3.12	A detailed site sketch has been included
_____	3.13	Laboratory analysis reports for all samples are included
_____	3.14	Chain-of-Custody sheet(s) or a laboratory log are included
_____	3.15	A Closure Assessment Report Form (DEP4058) has been included
_____	3.16	All minimum sampling requirements according to Section 3.0 were followed during re-sampling, if necessary
_____	3.17	The UST Branch has been contacted in writing explaining why the sampling requirements cannot be followed, including the alternative sampling proposal plan, if necessary
_____	3.18	The facility/site was classified in accordance with 401 KAR 42:080, if necessary

The Pre April 18, 1994 Voluntary Regulation 401 KAR 42:071 Final Checklist may be completed and signed by the owner, operator, contractor, or consultant.

Signature _____ Date _____

Name and Title (Type or Print) _____